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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/563,752

01/09/2006

Yasuhiro Matsumoto

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04/16/2008

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EXAMINER

LACLAIR, DARCY D

ART UNIT

PAPER NUMBER

4171

NOTIFICATION DATE

DELIVERY MODE

04/16/2008

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ADIPFDD@bipc.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/563,752	<b>Applicant(s)</b> MATSUMOTO ET AL.	
	<b>Examiner</b> Darcy D. LaClair	<b>Art Unit</b> 4171	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____.                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1/9/2006</u> .  | 6) <input type="checkbox"/> Other: ____.                          |

## **DETAILED ACTION**

### ***Specification***

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. Description of the improved property characteristics as well as reference to the benzooxazine resin and boehmite and alumina fillers is recommended.

### ***Claim Objections***

1. Claims 3, 4, 6, 8 are objected to because of the following informalities: "an alumina-based compound as a filler" fails to further limit the claim, because boehmite is an alumina based filler. The claim could be written "and additionally a different alumina-based compound as a filler" for additional clarity.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schreiber et al. (5443911) in view of Schreiber et al. (5021484) and Napier (3357791).
4. Schreiber '911, and Shrieber 484, incorporated by reference teach a curable resin which is a mixture of a thermically curable compound containing 1-oxa-3-aza

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tetraline and a curable brominated epoxy resin. (column 2) As the preferable epoxy resin, glycidyl ethers of brominated phenols or brominated novolaks are detailed. (col 4 line 3) Schreiber further allows that additives such as fillers and reinforcement fibers may be added to tailor the properties of the resin. (col 7 line 3)

5. Specifically with regard to claim 9, 12, and 13, the resins described by Schreiber 911 and 484 are thermosetting resins, curable temperatures above 100°C. (911 col 6 line 37, 484 col 4 line 44)

6. With regard to claim 10 and 11, Schreiber 911 describes the content of component (b) (the phenol resin) as 30% or less by weight of the total resin weight, with the balance being the 1-oxa-3-aza tetraline resins. (col 5 line 64) These resins are obtained by a reaction of a phenol with a formaldehyde and an amine:



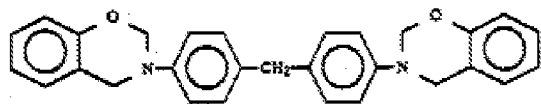
7. Where R is hydrogen, halogen, alkyl, or alkoxy, and R' is aliphatic or aromatic. (911 col 2-3, 484 col 1)

8. In both Schreiber documents, the following specific example resins were prepared:

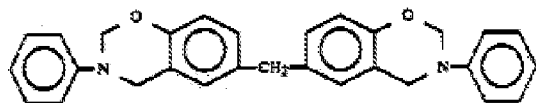
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**1-Oxa-3-aza tetraline compound 1**

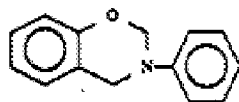
prepared by reacting 4,4'-diamino-diphenylmethane 39 with phenol and formaldehyde in a molar ratio of 1:2:4.  
Structural formula:

**1-Oxa-3-aza tetraline compound 2**

prepared from the reaction product of 2 mols phenol and 1 mol formaldehyde by a second reaction with 2 mols aniline and 4 mols formaldehyde. Mean composition:

**1-Oxa-3-aza tetraline compound 3**

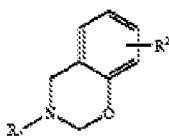
prepared by reaction phenol with aniline and formaldehyde in a molar ratio of 1:1:2. Structural formula:



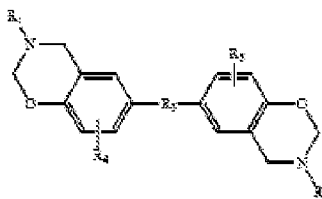
(col 8 in Schreiber 911 and column 5 in Schreiber 484)

9. These correspond to the compounds of the instant application:

10



(1)



(2)

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Compound (1) is identical to Strieber's Compound (A), where  $R = R_2$  and  $R' = R_1$ .

Compound (2) where  $R_1$  is a phenol group,  $R_2$  is a methyl group, and  $R_4$  and  $R_5$  are hydrogen is analogous to 1-Oxa-3-aza tetraline compound 2 of Schreiber's patent.

10. As to Claims 3, 4, 6, and 8, Schreiber 911 teaches that flame retardants, in particular aluminum hydroxide, are of particular importance as an additive. (col 7) This corresponds to applicant's additional alumina-based filler.

11.

12. Schreiber '911 fail to teach bauxite or boehmite specifically as a filler, however in the earlier referenced work, Schreiber 484, "aluminum hydroxide" compounds (col 4 line 3) are distinguished from fillers with the composition  $AlO-OH$ , such as bauxite, which has boehmite as a primary component. This suggests that bauxite and/or boehmite was a filler known to those of ordinary skill in the art, and could have been readily incorporated into Schreiber's invention to achieve the desired physical properties of strength and abrasion resistance.

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13. Napier teaches the preparation of such boehmite particles which may be incorporated into elastomer products and plastics, such as the resin taught by Schreiber, to improve strength and/or abrasion resistance. (col 11 line 71 through col 12 line 11)

14. With regard to claims 5 - 8, and 11, relative to the amount of boehmite, Napier teaches that the boehmite of his invention may be incorporated into a resin from 1 – 30% by weight (which would be equivalent to a 1 to 45 parts by weight based on 100

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parts of resin, corresponding to a significant portion of applicants claimed range of 1 to 150 parts by weight). (col 11 line 71-75)

With regard to claims 1-8, relative to the shape and size of the boehmite particles, Napier teaches a process with a great deal of flexibility with regard to the physical characteristics of the boehmite particles. (col 1 line 50) Specifically, he teaches both blade-shaped or platelet-like shapes (corresponding to applicants acicular boehmite), (col 2 line 38) as well as long fibers (corresponding to applicants cylindrical boehmite), (col 2 line 44). The size of the fibrous product of Napier's invention is described as ranging from 300 to 30,000 angstroms in length on the longest dimension, 20 to 400 angstroms in the second longest dimension, and 10 to 50 angstroms in length on the smallest dimension. (col 3 line 4) This corresponds to a roughly cylindrical shape with a minor diameter of 40 nm or less (1 - 40 nm). Additionally, the aspect ratio of these particles (based on the longest dimension and the smallest dimension) could be anywhere from 6 to 3000. The platelets are described as having a maximum average dimension of 300 angstroms, which is also well within the 1 – 100 nm range claimed by applicant.

### ***Conclusion***

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kondo et al. (3931095).

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16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Darcy D. LaClair whose telephone number is (571)270-5462. The examiner can normally be reached on Monday-Thursday 7:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Tarazano can be reached on 571-272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. Lawrence Tarazano/  
Supervisory Patent Examiner, Art Unit 4174

Darcy D. LaClair  
Examiner  
Art Unit 4171